FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1925

Mar. 14 .... R.A.F. (India) Reunion Dinner.
Mar. 19 .... Capt. F. Tymms: "Practical Navigation of Aircraft," before R.Ae.S.
Mar. 23 .... Entries close for Schneider Cup Race.
Mar. 23 .... Entries Close for Gordon Bennett Balloon Race.
Mar. 25 .... Royal Aero Club Annual General Meeting.
Mar. 26 .... Dr. Eckener (Managing Director, Zeppelin Airship Co.): "Modern Zeppelin Airships," before R.Ae.S. (Society of Arts).
Mar. 30 .... Royal Aeronautical Soc. Annual General Meeting.
Apr. 23 .... Colonel F. Searle: "The Maintenance of Commercial Aircraft," before R.Ae.S.
Apr. 24 .... Commander C. D. Burney, C.M.G., M.P., R.N.: "The Position of the Airship in Aerial Transport," before I.Ae.E.
Apr. 30 .... Wilbur Wright Lecture, Rear-Admiral D. W. Taylor: "Some Aspects of the Comparison of Model and Full-Scale Tests," before R.Ae.S.

EDITORIAL COMMENT.

IT is by now agreed on all sides that if we are ever to make flying popular, we must make it safe, so safe, in fact, that it is looked upon as being a good deal safer than train or steamer. Until we convert the general public to that view, it will not matter how efficient our machines are aerodynamically and how economical in operation, the public will not patronise them to the extent necessary to success.

Safety in Flying

We are now, of course, referring to the form of civilian flying at present known under the courtesy title "commercial." In order to attain that end, no effort should be spared and no expense allowed to stand in the way. If the statistics of flying accidents are examined, it is found that by far the largest percentage of serious crashes are the result of stalling when near the ground. The causes of the stall may be various. The engine may fail just after the machine has left the boundaries of the aerodrome; it may fail on a cross-country flight, and the pilot may accidentally stall it while attempting to reach a better spot for a forced landing than any within his immediate vicinity; the pilot may accidentally stall his machine while landing, but cases of this appear extremely rare, and would probably never happen to an experienced pilot, such as those flying regularly on the air routes.

From a superficial examination of the subject, it might appear that the obvious remedy would be to find a method of retaining control beyond the stalling angle. While this subject is of extreme importance, and is being pursued vigorously by designers and research workers, it does not afford a complete solution, since a stalled aeroplane, even if under control, will descend at a fairly high vertical velocity, and no practicable undercarriage would be able to deal with the impact. The vertical nose dive at high speed would, probably, be avoided, and the "flat" landing might save fatal injury to occupants, but control beyond the stalling angle takes us only part of the way. It might be argued that engines should not fail, and, as a matter of fact, it is very rare that a modern aero engine itself fails in any of its vital parts. It is usually some accessory or part of the installation which

leads to failure. Improvements are constantly being made, and will continue to be made, but it seems unlikely that we shall ever attain to 100 per cent. reliability. Even older means of transport, with hundreds of years of development behind them, have not attained 100 per cent. reliability, and accidents still occur. It would, therefore, seem that what we must do to bring the 100 per cent. reliability nearer within the near future, is to minimise the seriousness of the results of an engine failure. In this week's issue of FLIGHT we publish an article on the subject by Mr. Bramson, who is one of Major Savage's sky-writing pilot's, and who has had wide experience as a pilot of different types of machines. Mr. Bramson, it will be seen, takes for his text the formulæ given by Mr. J. D. North in a paper before the International Air Congress, showing the probabilities of forced landings with one, two and three engines. On the assumption that in each case two-thirds of the total power is required for horizontal flight with full load, he arrives at the conclusion that the twin-engined machine is worse than the single-engined (on account of the two-thirds requirement, of course), and that the three-engined, if all three units are of the same power, is vastly better than the other two types. We are not certain that we agree entirely with Mr. Bramson in all he says, but theoretically he and Mr. North do appear to have shown the advantages of the three-engined type. The formulæ, however, are based upon certain assumptions which may not obtain in practice. For instance, it is assumed that in all cases each engine is equally reliable, or unreliable. Now that is probably not entirely accurate, as the arrangement of three engines must, it would seem, necessarily complicate the installation to some extent, and thus cause each individual engine to be a little less reliable than the single-engined type, in which direct gravity feed from a tank in the top plane is provided, with the simplest possible petrol system.

Then there is the question of the aerodynamic and structural efficiency of the machines. It seems likely that the single-engined aeroplane will always be somewhat more efficient than the three-engined, owing to the extra resistance of the two-wing nacelles. Mr. Bramson points out that any such disadvantage is to some extent balanced by the saving in structure weight made possible by distributing the engine weights, and that in a monoplane type the wing engines can be partly enclosed in the wing. In this connection it is of interest to note that in the latest number of the German *Junkers-Luftverkehr Nachrichtenblatt* a photograph is published of a new Junkers three-engined monoplane, the type G.23, in general similar to the now familiar Junkers single-engined monoplanes, but with apparently, a large engine in the nose of the fuselage and two smaller engines on the wings. The type certainly looks "clean," but no performance figures are available. The Handley Page W8F has now been flying for some time, and one of these machines is on its way to Belgian Congo and appears to have given satisfactory results as far as reliability is concerned. It is known that other British three-engined machines are coming along, so that within the next year or so we should be able to find out in practice whether or not the type does give us the reliability desired. In the meantime, we should be pleased to have the views of readers on the subject, especially of those described by Mr. Bramson as the "single-engined school."

"It Pays to Advertise"

In a short article in *The Times*, of March 5, the Paris correspondent of that paper gives some interesting statistics relating to the export of French aviation material. In 1923, the value of such exports amounted to 100,000,000 francs, while in 1924 this figure was increased to 190,000,000. The writer of the article attributes to a large extent this increase to the publicity which French aircraft have received in connection with the great flights made by French aviators. We have repeatedly expressed the view in these columns that such flights, and also the establishment of new world's records, do more than anything else to convince the world of the superiority of the aviation material of the nations whose machines undertake them. In France, the Government assists its constructors materially, not only by direct encouragement, but also by larger orders in the ordinary way, and, consequently, French constrution firms have been able to undertake flights which British firms have lacked the capital to finance. Surely, there is here a lesson worth taking to heart? We are aware, of course, that the rate of exchange may have had quite a deal to do with the preference shown by some countries for French aircraft, and that if a potential customer has the choice of two machines with the same performance, he will naturally choose that which is the cheaper. It does not, however, appear likely that this fact accounts entirely for the increase in the figures of French aero exports, a large proportion of which is undoubtedly due, as *The Times'* correspondent points out, to the advertisement of some very splendid flights. We in this country are, perhaps, a little apt to fail to realise the greatness of some of the spontaneous British flights, such as those of Mr. Cobham to Africa in a day, and now his out-and-home journey to India with Sir Sefton Brancker.

In the matter of world's records the position as regards Great Britain is still more deplorable. We have on many occasions recently referred to the value to a nation of holding certain of the more important world's records. Quite recently a series of new records have been established which again bring the subject into prominence. We refer to the 20 new world's records established by an Italian-built Dornier "Wal" flying-boat fitted with two Rolls-Royce "Eagle" engines. The records beaten are for speed, distance, duration and altitude, and cover useful loads of 250 kg., 500 kg., 1,000 kg., 1,500 kg., and 2,000 kg. The performance was a very fine one, and we have at least the consolation that British engines were used.

The question, however, naturally arises, could not some British machine have established the same or even a better record? We are fairly certain that some of them at least could have been beaten by existing British machines. Take, for instance, the huge Fairey "Atalanta" fitted with four Rolls-Royce "Condor" engines. It seems likely that this machine could have carried the heavier loads over even greater distances and remained in the air longer. The "Atalanta" is an Air Ministry machine, it is true, but is there any reason why service pilots should not be allowed to make the attempt, properly observed by representatives of the Royal Aero Club, so that the performance might be officially recognised. We fail to see any very good reason why this should not be allowed, not only in the case of the "Atalanta," but with other machines likely to be able to beat certain existing world's records.

FLIGHT
AIRCRAFT ENGINEER AIRSHIPS

AVIATION IN MEXICO

IT is not, perhaps, generally known—on this side of the Atlantic at any rate—that the Republic of Mexico has, for a considerable number of years, devoted much attention to aviation, principally on the military side. They have possessed an air service which has been developed year by year into one which, as far as our knowledge goes, is now a fairly efficient, although small, air arm. At first they relied on foreign machines, consisting mainly of Avros, Morane-Saulnier parasols, Salmson biplanes, F-type Farman bi-motored biplanes, etc. For various reasons difficulty was experienced in obtaining aircraft and engines from foreign sources, so it was decided that these should be produced in Mexico itself. Late in November, 1915, therefore, a National Aircraft Factory was established at Valbuena, Mexico City, equipped with up-to-date machinery, etc. Here several monoplanes of the Blériot and Morane-Saulnier type were constructed, as well as a training biplane fitted with a Mexican-built "Aztatl" engine, of the Anzani type, developing 80 h.p.

A curious single-engined pusher twin-fuselage biplane was also produced at the factory, and about the year 1918 a neat tractor-fuselage scouting biplane, the "Microplano," was built, which gave, we believe, satisfactory results. It was fitted with a 160 h.p. Hispano-Suiza engine, which engine, it may be mentioned, was built under licence at a specially-equipped branch of the factory at Valbuena. The "Microplano" possessed several interesting features, and was a single-bay biplane, with the top plane very slightly larger in span than the lower one. A somewhat unusual arrangement was adopted for the interplane struts, which in addition to sloping outwards were staggered as regards their fore-and-aft location, *i.e.*, the rear struts were further out from the fuselage, so that the distance from the wing tips, which had a considerable rake, was the same for both rear and front struts.

Lateral balance was by wing warping, and there were no fixed tail surfaces—rudder and elevators being of the balanced Morane-Saulnier type. The girder fuselage was very deep forward, but tapered sharply towards the rear to a point. The "Microplano"—which was some 26 ft. in span—had a speed of about 125 m.p.h., and weighed, all up, 1,400 lbs., the useful load being 400 lbs. The tractor air-screw was also of Mexican manufacture.

Just recently the National Aircraft Factory produced three interesting machines, which we illustrate by the accompanying drawings of the plan, side, and front elevations of each type. We also reproduce a photograph of one of these machines, which differs slightly from the model shown in the drawing. All three machines are monoplanes of the "semi-cantilever" type, having thick wing-sections of the Jowkowsky breed. Sr. A. de Lascuráin y Osio, Director-General of the Factory, is responsible for the design, and during their test flights, piloted by Joe Ben Lievre, they gave every satisfaction, both as regards the construction and the performance.

The first of these machines, the "3-E-130," is a single-seater scout, with the straight main planes mounted above, but very close to, the fuselage, and braced to the latter by struts extending to a point about one-third the total span from the wing tip. The model illustrated by the photograph has a single I-strut each side of the fuselage bracing the wings, whilst the drawings show a pair of struts each side—the arrangement of which does not appear to us to be all that is desired aerodynamically.

The pilot's cockpit is located immediately behind the trailing edge of the wing, which is about level with the pilot's eyes. This machine has thus a good range of vision. It is fitted with a 160 h.p. Gnome-Rhone engine. The principal characteristics of the "3-E-130" are :—

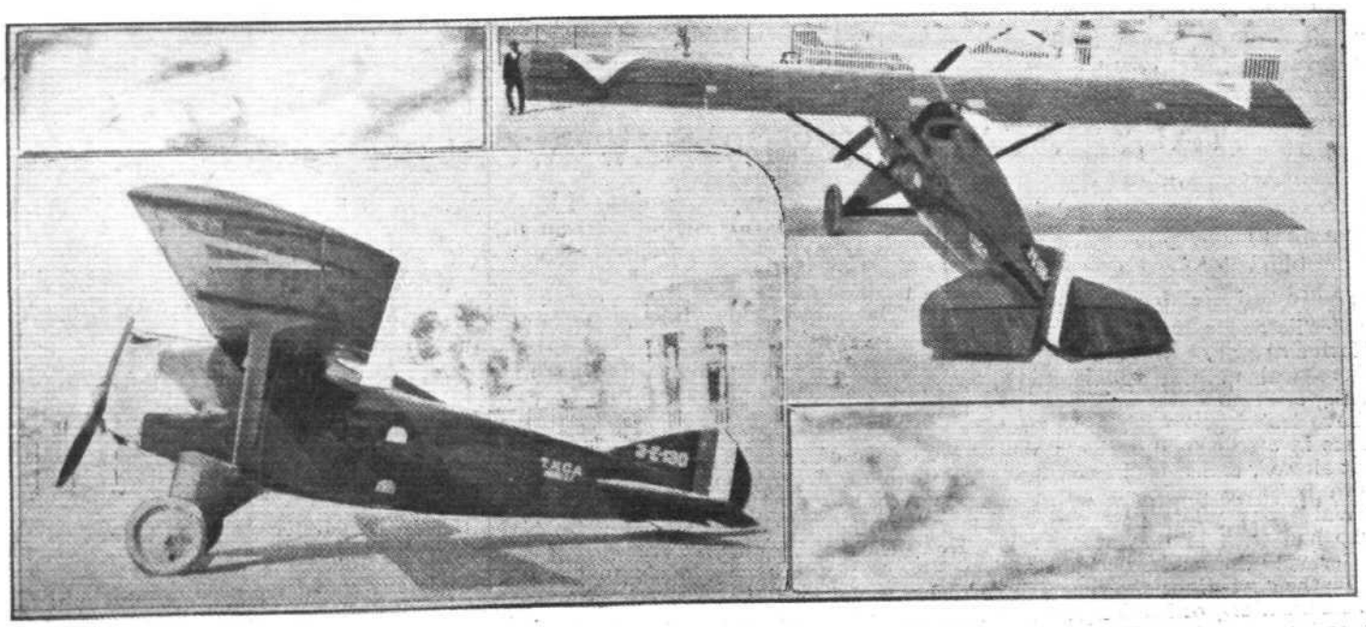
Span	34 ft.
Chord	5 ft. 3 ins.
O.A. length	21 ft. 9 ins.
Height	7 ft. 4 ins.
Area	172 sq. ft.
Weight, empty	1,474 lbs.
Weight, laden	1,892 lbs.
Speed range	47–139 m.p.h.
Ceiling	19,680 ft.
Range	1 hr. 30 mins.

The second machine, the 5-E-132, or "Mexico," is a two-seater school 'bus, also of the parasol monoplane type, fitted with a Le Rhone engine of 80 h.p. The main feature of this machine consists of the unusual plan form of the wings. These have the leading edge swept back from a point about one-third the span from the tips, the centre section being straight. The trailing edge, however, is swept back at the centre section, and is then straight as far as the ailerons. The wings are braced from the fuselage by a pair of struts as in the previous model.

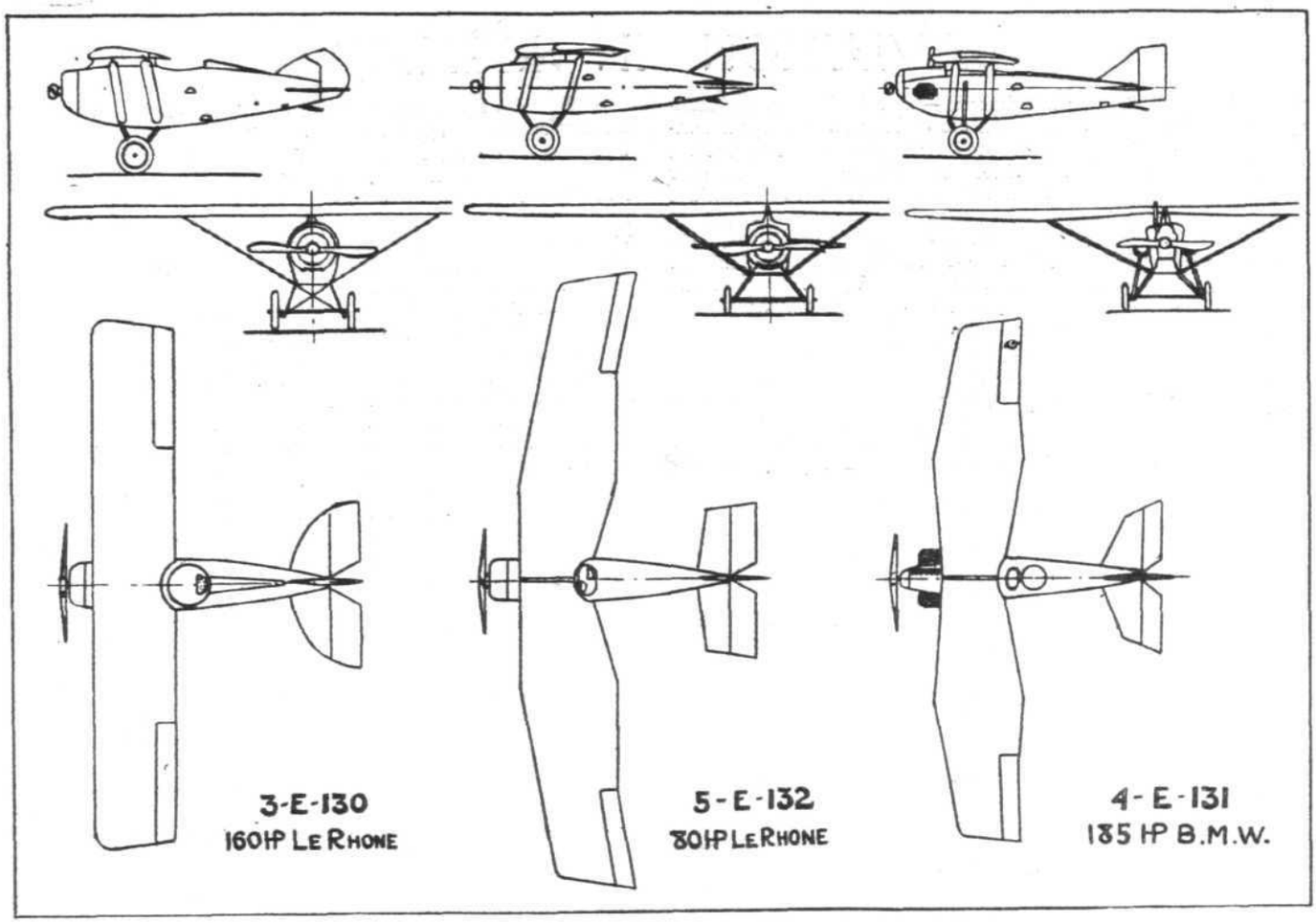
Pilot and passenger are located in one cockpit immediately behind the trailing edge of the wings, the seats being slightly staggered. The main characteristics of the "Mexico" are :—

Span	47 ft.
Chord	7 ft. 6 ins.
Overall length	22 ft. 4 ins.
Height	8 ft. 6 ins.
Area	279¾ sq. ft.
Weight, empty	1,276 lbs.
Weight, laden	1,760 lbs.
Speed (maximum)	74 m.p.h.
Ceiling	16,400 ft.
Range	2 hrs.

The third machine, the 4-E-131, or "Quetzalcoatl," is similar to the last, but larger, and is intended for bombing and reconnaissance work. It is fitted either with a 185 h.p. B.M.W. engine or a 400 h.p. "Liberty." The wings have much the same shape as those on the school machine, except



AVIATION IN MEXICO: Two views of the 3-E-130 scout. The above model differs slightly from that shown in the drawings.



AVIATION IN MEXICO: General arrangement drawings of three military monoplanes recently produced at the Mexican National Aircraft Factory, Valbuena. The 3-E-130 is a single-seater scout; 5-E-132 is a two-seater school machine; 4-E-131 is a two-seater reconnaissance and bombing 'plane.

that the leading edge of the centre section slopes inward towards the centre, giving the wings a W-shape in plan. The pilot's and observer's cockpits are located behind the wings, where a good range of vision in all directions is obtained. A Lamblin radiator is mounted on each side of the fuselage. The armament consists of a fixed Vickers gun, firing forward, and a twin Lewis gun mounted on a scarff ring in the rear cockpit. It will be noticed that the landing chassis in this machine differs from the others. The principal characteristics of the 4-E-131 are :—

Span	50 ft. 5 ins.
Chord	19 ft. 7 ins.
Overall length	27 ft.
Height	9 ft. 9 ins.
Area	355 sq. ft.
Weight (empty)	2,486 lbs. (B.M.W.); 2,860 lbs. ("Liberty").
Weight, laden ..	3,850 lbs. (B.M.W.); 4,620 lbs. ("Liberty").
Speed range ..	46–124 m.p.h. (B.M.W.); 50–155 m.p.h. ("Liberty").
Ceiling ..	21,300 ft. (B.M.W.); 24,600 ft. ("Liberty").
Range ..	5 hrs.

ITALY ESTABLISHES 20 NEW WORLD'S RECORDS

Rolls-Royce Engines Used

ITALY has suddenly jumped into the lime light by establishing in one swoop, or more correctly in two separate flights, no less than 20 new world's records. The machine used in the flights was a Dornier "Wal" twin-engined flying-boat, built under licence in Italy by the S.A.I. Costruzioni Meccaniche di Marina di Pisa, and engined with two Rolls-Royce "Eagles." The machine has been illustrated in FLIGHT, and is an all-metal flying-boat monoplane, with the two engines placed in tandem above the wing, one driving a tractor and one a pusher screw. Thus in case of one engine stopping the centre of thrust is not altered, and it is claimed that the machine will carry on with but one engine running. In the record flights the "Wal" was piloted by the Italian aviator Guido Guidi, who had with him as second pilot Herr Richard Wagner, a German pilot, and an engineer.

In the first flight the machine carried a useful load (*i.e.*, as sand ballast) of 1,500 kgs. (3,300 lbs.), and established the following record performances: Speed over 100 km., 173·38 km./h. (108 m.p.h.); over 200 km., 172·53 km./h. (107·5 m.p.h.); over 500 km., 171·00 km./h. (106¼ m.p.h.). Total distance with 1,500 kg. load, 507·38 km. (315 miles). Total duration, 3 hours 33 mins. 35 secs. Altitude, 3,682 metres (12,100 ft.).

With a useful load of 2,000 kgs. (4,400 lbs.), the following performances were put up: Speed over 100 km., 171·954 km./h. (107 m.p.h.); speed over 200 km., 170·622 km./h. (106 m.p.h.). Total distance, 253·69 km. (158 miles). Altitude, 3,006 metres (9,850 ft.). The speeds with smaller loads were also far ahead of previous records, so that Italy in the same flights gathered in several of the smaller fry. The net result is that the United States have lost 9 records, France 3, Denmark 3, and Italy has established 5 new ones.

It is gratifying to note that British engines made the flight possible, but the records ought to have been established by a British machine. Incidentally, it is somewhat humorous to reflect that, although the records are recognised as Italian, the machine was virtually German, the engines British, and one of the pilots a German.

FLIGHT

THE PISTOLESI VARIABLE-PITCH AIRSCREW

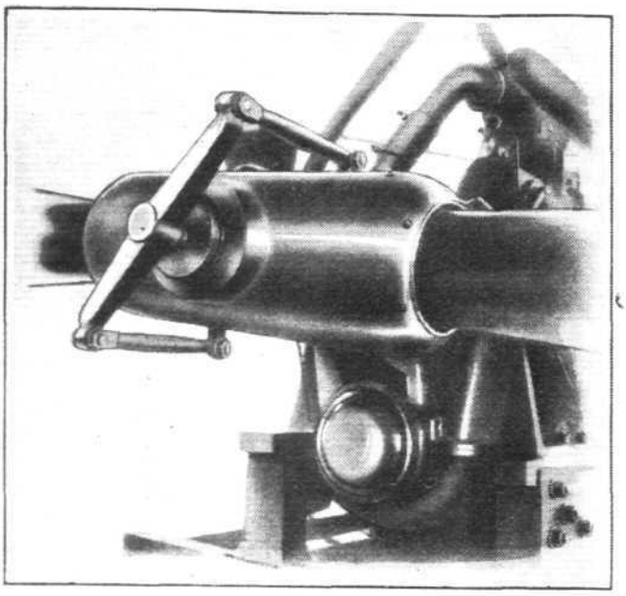
ONE of the problems in aeronautical engineering that has engaged the attention of designers and inventors for some considerable time past is that relating to the variable-pitch airscrew. That the variable-pitch airscrew is a desirable component will not be denied, for its advantages over the ordinary fixed airscrew are obvious. In the first place, such an airscrew can be used, within limits, on any type of engine; in other words, it can instantly be adapted to suit the characteristics of any particular engine—such as variation of crankshaft speed, etc.

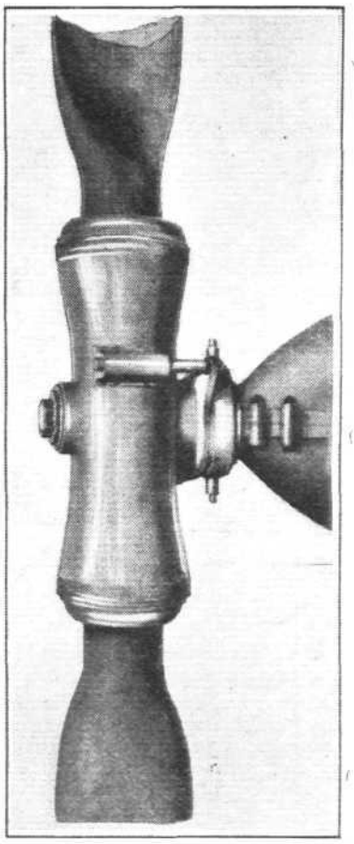
Secondly, the variable-pitch airscrew can be adjusted to meet the varying conditions of flight. It is this latter feature that makes the variable-pitch airscrew most desirable, for by its use, in conjunction with the supercharger, we can obtain the best performance out of a machine at great altitudes without sacrificing the efficiency of that machine during flight near the ground. In short, the admitted advantages of the supercharger can be utilised on a more sound, or practical, scale by means of the variable-pitch airscrew than is the case at present, where compromise figures very largely.

Its utility admitted, it must be assumed that its achievement is beset with problems by no means easy of solution, for, although many attempts to produce a realiable variable-pitch airscrew have been made in the past by designers in both Europe and America, it cannot be said that it has arrived at that stage when it can be put into general use. There is little doubt, however, that the problem is slowly but surely being overcome, and recently some promising results have been obtained with one or two designs. One of these designs in particular, which has already passed through some practical tests with no little success, hails from Italy, and it may be of interest to our readers if we give a few brief particulars of this airscrew—although, at the moment, we are unable to go into its technical and constructional details.

The airscrew in question is the "Pistolesi," which is being developed by the Società Idrovolanti Alta Italia (S.I.A.I.) of Sesto Calende, the constructors of the famous "Savoia" aircraft. A "Pistolesi" variable-pitch airscrew was recently fitted to a Spad XIII biplane fitted with a 220 h.p. Hispano-Suiza engine, and some interesting tests were carried out with same at the experimental aerodrome at Montecelio (Rome) by the Italian Aeronautical Research Bureau. Comparative tests were also made with the machine fitted with the "Pistolesi" airscrew and with a fixed-pitch airscrew.

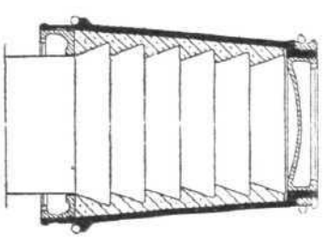
The results obtained were very promising, as may be gathered from the following facts: With the "Pistolesi" a gain of 8 kms. per hour (5 m.p.h.) on the horizontal speed was obtained; a gain of two minutes in climbing to 4,250 m. (13,900 ft.), or a gain of 15 per cent. of the total time employed, and a gain of 500 m. (1,640 ft.) on the practical ceiling. Exhaustive tests have also been carried out with this airscrew on the bench, as a result of which it would seem that the method of construction employed is quite satisfactory. During test the airscrew was operated for long periods at a rotational speed of 1.4 times the normal one, being thus subjected to a centrifugal strain equal to twice that obtaining under normal conditions. The airscrew withstood the test well, and without any indication of failure in any part.





AN ITALIAN VARIABLE-PITCH AIRSCREW: The "Pistolesi" airscrew, in which the pitch of the blades is varied by means of a hand-operated crank, at rear of engine. Above, on left, is a model for engines with hollow crankshafts, and on the right is seen the model for engines fitted with solid crankshafts.

Briefly, the "Pistolesi" variable-pitch airscrew consists of a central metal portion carrying the two wooden blades, the roots of which are set in steel muffs. The blades can be rotated within the central housing, around their longitudinal axis, by means of hand-operated gearing. One of the most difficult problems in connection with the variable pitch airscrew has beeen to effect a satisfactory union or connection between wooden blades and their central housing, or boss—especially when it is remembered that one has to contend with a strain due to centrifugal force of several tons, varying from 5 tons on small airscrews, up to 30 tons for the larger ones.



The "Pistolesi" Variable-Pitch Airscrew: Diagram showing the type of joint employed for securing the wooden blades in the central housing.

It was only after much investigation and the trying out of several types of joints, that the designer of the "Pistolesi" airscrew finally settled upon the system now employed on the airscrew. As may be seen from the accompanying diagram, the root of the blade has a series of conical steps

formed on it, which engage with similar steps formed inside the muff. The correct angle, number, etc., of these conical steps are factors, we understand, that called for considerable experiment and research, but the system has, in the end, given very satisfactory results as far as the tests with this airscrew have gone up to now.

The "Pistolesi" airscrew is very easily controlled by means of a small hand crank (about 20 ins. radius), located within easy reach of the pilot, and only five or six turns are needed to obtain any pitch required for ordinary purposes. Complete reversal of the blades (as regards pitch) may be obtained with about 25 turns of the operating crank, which may be accomplished by means of some form of friction gear from the engine.

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NAPIER "LION" PASSES 104-HOUR TYPE TEST

Just recently the 450 h.p. Napier "Lion" aero engine successfully completed another Air Ministry Type Test of 104 hours' duration, under the official supervision of the Aeronautical Inspection Department. On this occasion, however, instead of taking the standard rating of 450 h.p., it was run at the rated horse-power of 470. Ten periods of ten hours' duration each, at 2,000 r.p.m., were followed by one hour's high-power test at full throttle, at 2,200 r.p.m., developing 494 b.h.p.

During the 100-hours' test, the oil consumption worked out at 0·015 pint per b.h.p.-hour, and the fuel consumption at 0·527 pint per b.h.p.-hour.

This latest test brings the total number of hours under which the Napier engine has been tested by the British Air Ministry to over 742 hours, and on every occasion the engine has carried out its trial most satisfactorily without any trouble. We give herewith the details of this latest type test :—

Air Ministry 104-Hour Test on Napier "Lion" Aero Engine

Series V. No. 50486. 5·8-1 *Compression Ratio.*
December 30, 1924—*January* 30, 1925.

Nature of Run.	Duration.	R.P.M.	B.H.P.	Fuel Consumption. Pts./b.h.p./hr.	Fuel Consumption. Gals./hr.	Oil Consumption. Pts./b.h.p./hr.	Oil Consumption. Pts./hr.
Power run on Heenan and Froude Brake. Full Throttle	5 mins. at each speed	2200	500	0·532	32·8	—	—
		2100	488	0·528	31·9	—	—
		2000	472	0·539	31·5	—	—
		1900	455	0·546	30·7	—	—
		1800	441	0·561	30·6	—	—
		1700	421	0·581	30·2	—	—
		1600	401	0·598	29·8	—	—
		1700	421	0·582	30·2	—	—
		1800	441	0·563	30·6	—	—
		1900	459	0·550	31·3	—	—
		2000	475	0·538	31·6	—	—
		2100	489	0·532	32·1	—	—
		2200	502	0·534	33·3	—	—
10-Hour Duration on H. & F. Brake. Last 5 mins. full throttle	9 h. 55 m.	2000	423	0·528	27·8	0·0118	5·0
	5 m.	2000	465	0·532	29·4	—	—
Do.	9 h. 55 m.	2000	422	0·537	28·3	0·0115	4·9
Do.	5 m.	2000	463	0·543	30·7	—	—
Do.	9 h. 55 m.	2000	423	0·519	27·5	0·0137	5·8
Do.	5 m.	2000	466	0·532	31·4	—	—
10-Hour Duration, airscrew in hangar	10 h.	2000	423	0·527	27·9	0·0123	5·2
Do.	10 h.	2000	423	0·519	27·4	0·0161	6·8
Do.	10 h.	2000	423	0·516	27·3	0·0170	7·2
Do.	10 h.	2000	423	0·518	27·4	0·0170	7·2
Do.	10 h.	2000	423	0·533	28·2	0·0161	6·8
10-Hour Duration on H. & F. brake. Last 5 mins. Full throttle	9 h. 5	2000	422	0·527	27·7	0·0181	7·7
	5 m.	2000	460	0·538	31·0	—	—
10-Hour Duration on H. & F. brake. Last hour at normal power & speed	9 h. 0 m.	2000	423	0·528	27·8	0·0200	8·5
	1 h. 0	2000	453	0·546	31·1	0·0199	9·1
Slow Speed Test on H. & F. brake	10 m.	470	12·9	1·55	2·5	—	—
High-Speed Test on H. & F. brake	1 h. 0	2310	363	0·561	25·5	0·0276	10·0
High-Power Test on H. & F. brake. Full throttle	1 h. 0	2200	494	0·528	32·8	0·0210	10·4
Power, on H. & F. brake. Full throttle	5 m. at each speed	2200	493	0·528	32·9	—	—
		2100	480	0·531	32·2	—	—
		2000	463	0·536	31·3	—	—
		1900	442	0·555	30·9	—	—
		1800	422	0·574	30·5	—	—
		1700	403	0·598	30·4	—	—
		1600	379	0·628	30·0	—	—
		1700	405	0·595	30·4	—	—
		1800	430	0·565	30·6	—	—
		1900	450	0·547	31·0	—	—
		2000	467	0·534	31·4	—	—
		2100	483	0·530	32·2	—	—
		2200	494	0·532	33·2	—	—

Total running time of Type Test : 104 hrs. 20 mins.

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Sir Sefton Brancker nearing Home

Sir Sefton Brancker's big aerial tour is rapidly drawing to a close, and his trusty DH.50 (Siddeley "Puma"), piloted by Alan Cobham, is expected back in England today (Thursday). Sir Sefton left Baghdad on March 2, and flew to Rayak Aerodrome, Beyreuth, continuing to Aleppo next day. On March 5 they left Aleppo at 7.45 a.m. and arrived at San Stefano Aerodrome, Constantinople, at 4 p.m., having landed at Konia for petrol. Belgrade was reached on March 7, and the next day they proceeded to Vienna, stopping at Budapest for lunch *en route*. They arrived in Prague on March 9.

Another Ministerial Visit to the East

It is officially announced that the Secretary of State for the Colonies and the Secretary of State for Air will visit Iraq and Palestine on official business during the Easter Recess. As at present arranged, Mr. Amery and Sir Samuel Hoare, accompanied by officials of the Colonial Office and of the Air Ministry, will leave England on March 19, and will return towards the end of April.

Amundsen's Flight to the Pole

Capt. Roald Amundsen states that the flight to the North Pole, which was postponed last year, has now been finally decided on, and will take place early this summer. Capt. Amundsen and M. Rijser Larsen, the Norwegian pilot, are now on their way to Oslo, *via* Copenhagen, to make preparations for the attempt. Arrangements have been made with the Dornier firm at Pisa for the construction of two seaplanes, and with Rolls-Royce, Ltd., for the engines. The machines will be shipped to Tromso next month. The expedition will comprise sixteen members, and the two machines will be piloted by Capt. Amundsen and Mr. Elmsworth.

FLIGHT

ON ENGINE FAILURES AND FORCED LANDINGS

By M. L. BRAMSON, A.C.G.I., M.I.Ae.E.

IT must be the aim of all who, for sentimental or utilitarian reasons, have the progress of aviation at heart to render it at least as safe as transport by land or water.

The most important step towards that end that can be taken at once is the exclusive use for passenger transport of machines capable of normal flight after the failure of one engine has occurred. In practice this means three-engine aeroplanes designed to fly normally with two-thirds of the available horse-power. (If two engines only are used the above condition would imply 100 per cent. excess of engine power over and above that required for normal flight, which would be manifestly uncommercial.) Such a machine roughly follows standard practice as to excess power available for acceleration and climb—that is, if all three engines are of equal power.

So long as pilots are expected to accept the responsibility for the lives of passengers whilst having to take off and fly low over unsuitable country, "hanging" on one engine, the safety of air transport will be illusory.

In what follows it is proposed to meet the chief arguments against three-engine commercial aircraft, and to show that such machines provide a rational and indispensable remedy against some of the worse aspects of present-day civil aviation.

It is argued that the chances of engine failure increase proportionately with the number of engines. This is true, but beside the point. It is not the chance of an engine failure, but that of a forced landing that matters.

All forced landings must logically be regarded as potential accidents, likely, it is true, to vary in seriousness with the kinetic energy of the machine at the moment of impact. A low stalling speed is therefore of extreme importance as a relative safeguard *after* an emergency has arisen, but does not in any way prevent the emergency from occurring.

At a paper read before the International Air Congress in 1923, Mr. J. D. North, pointed out that the chances of forced landings are related to the number of engines as follows (It is assumed in all three cases that two-thirds of the available horse-power is necessary for normal flight.) :—

No. of Engines.	Chances of Forced Landings.
1	$\frac{1}{n}$
2	$\frac{2n-1}{n^2}$
3	$\frac{3n-2}{n^3}$

where $\frac{n}{1}$ is the odds against any one engine failing and is taken as constant. Mr. North's figures, which are fundamental, deserve amplification in view of the extent to which single-engine machines have been persistently in favour.

To fix our ideas, let us define what we mean by chances of engine failure. We will assume that if engines of a certain type, operated in identical conditions, suffer on the average one failure in the course of an aggregate time of running of 6,000 hours, then the chance of any one engine failing in any one particular hour of flying is $\frac{1}{6000}$. Assuming the length of an average flight to be three hours, we deduce that the chance of any one engine failing in the course of any one average flight will be three times as great, that is, $\frac{1}{2000}$. These figures, as a matter of fact, would seem to represent, with sufficiently good approximation for the purpose, the best present-day results obtained in civil aviation. Taking, then, the chance of engine failure in the course of any one average flight as a commonsense interpretation of $\frac{1}{n}$ and adopting $\frac{1}{2000}$ as a reasonable figure, we get the chances of forced landings as follows :—

No. of Engines. ($n = 2{,}000$.)	Chances of Forced Landings.
1	$\frac{1}{2000}$
2	$\frac{1}{1000}$
3	$\frac{1}{1{,}333{,}000}$

It will therefore be seen that the liability to forced landings of the three-engine machine is roughly 670 times smaller than that of the single-engine machine and 1,333 times smaller than that of the twin-engine machine.

It is probable that in actual practice the three-engine machine will be still more favourable than indicated by these figures. Every pilot knows how difficult it is, even with extreme care, to take off from an aerodrome at all times in such a manner that a safe landing could be effected if engine failure occurred at any instant during the first minute or so of the flight. In fact, one of the international rules of aerial navigation actually operates so as to prevent pilots from making the safest kind of take off. If the chances be worked out of the necessity for a forced landing arising with a three-engined machine during that brief space of time (the chance of two engine failures within any one minute), it will be found to be infinitesimal. In other words, the risk is, for all practical purposes, non-existent.

There is a further important psychological aspect of the matter which, though not subject to probability calculations, is almost as important. The direct cause of most fatal accidents is involuntary stalling. It is probably accurate to say that no experienced pilot ever stalls his machine involuntarily unless his mind is so preoccupied by some difficulty, such as that of bringing off a safe forced landing, that his attention for a few instants is distracted from the all-important subject of his flying speed. There is far less likelihood of a pilot making a faulty manœuvre, due to sudden nervous strain, when he can regard the prospect of an engine failure with complete equanimity.

It is further alleged by the "single-engine school" that a three-engine machine must needs have an inferior performance compared with a single-engine machine, horse-power for horse-power.

In the first place they appear to overlook that nothing is so costly or so destructive of performance, in a larger sense, as one single accident. Moreover, it is extremely probable that the factors of design which are unfavourable to the three-engined machine may be neutralised by others in their favour. For instance, the difference in total weight between one engine of a given horse-power and three engines of the same total horse-power may be partly, if not wholly, counteracted by a reduction in structure weight, due to the more favourable distribution of the weight of engines and of the propeller thrusts. The greater head resistance of the outer engines (in a thick-winged monoplane they may be partly situated in the wings), may to some extent be neutralised by the improved propeller efficiency, and by the fact that only one-third of the slip stream is pumping back on the nose of the fuselage and on the tail unit.

It is further contended that the maintenance and running costs will be considerably increased and that starting troubles will be trebled.

The best way to examine what sacrifices it is worth while making in order to reduce the chances of accidents to about $\frac{1}{1000}$ of what they are at present, is to estimate the cost of an accident, such as the recent one at Croydon.

The following are the main items :—

(*a*) Capital value of aeroplane.
(*b*) Loss of business until machine can be replaced.
(*c*) Idemnities to injured crew or passengers.
(*d*) Loss of business due to the destructive effect on public confidence in flying as a means of transport.

The last item is incalculable, for it involves not only the small minority who are already flying enthusiasts, but also the general non-flying public, who view with a kind of morbid satisfaction anything tending to confirm their prejudices against aviation.

With these items on one side of the balance sheet it is difficult to see how a case can be made out commercially in favour of single-engine machines.

Such points as increased regularity, due to the elimination of the present dangers of low flying and the absolute necessity for three-engined machines if landing and flying in fog are ever to be made safe are self-evident.

In conclusion, one would like to address one pertinent question to those who operate air lines in this country, not so much in the hope of an answer, as with a view to providing food for thought. What increase in the volume of business would they reasonably expect if fatal accidents were rendered so improbable that a free life insurance policy of, say, £5,000 could be issued with each ticket ?

LIGHT 'PLANE AND GLIDER NOTES

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, *who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.*

NATURALLY, one of the topics of the week is the announcement that the Air Ministry has evolved a new scheme in connection with subsidising the newly formed light 'plane clubs. Under the new arrangement, it is understood, the Air Ministry is prepared to provide for each club two complete light 'planes, one spare engine, and sundry incidental gear, the cost of the whole not to exceed £2,000. Instead of the £500 per annum at first contemplated as a contribution towards running expenses, the Air Ministry is now prepared to advance to each of the six "approved" clubs £1,000 for the first year, the amount of the grant for subsequent years to be reconsidered later. In case of any crash which results in the total loss of a machine, the Air Ministry offers to pay one-half of the cost of replacement.

* * *

ON the face of it, the Air Ministry's new offer appears fairly generous. A total grant of the equivalent value of £3,000, plus one-half of any replacement cost, would not seem at all a bad offer. Yet there is apparently considerable dissatisfaction with the offer. The objection is raised, and a perfectly sound one it is, that the clubs will not—at first, at any rate—be able to augment their flying stock by purchases of new machines, as nearly all the available funds will be swallowed up in purchasing ground equipment and in paying rent and insurance.

* * *

THE argument advanced is that two machines for a club with, perhaps, 200 members anxious to fly will be totally inadequate, and that the inevitable result will be that many members will lose interest not only in the club, but in flying altogether, as being beyond their reach. That this would be a serious loss to the nation cannot be denied, especially as the urgent necessity of encouraging our young men to take up flying is admitted on all sides.

* * *

THUS once more the position seems to have become one describable as a deadlock. In view of the limitation of the light 'plane subhead in the Air Estimates to £22,000, it cannot be expected that the Air Ministry will be in a position substantially to augment its present offer, and if we are to get going this year some other scheme seems to be required. In all fairness to the Air Ministry (and certainly nobody could accuse FLIGHT of being in the habit of siding with the A.M. on light 'plane questions), it must, we think, be said that the offer is a fair one, and perhaps as generous as one could hope for. The difficulty lies in the fundamental nature of the subject. Aeroplanes, of whatever type, cost a lot of money, and unless handled with considerable skill their upkeep is likely to run the owners into fairly large expense. With the view that two machines per club—or, let us say, one machine per 100 members of a club—is inadequate we entirely sympathise. At the civilian flying schools before the War it used, we believe, to be the rule at least to have one machine for every ten pupils. Even then there were those who were discontented with the long periods between "flips." There is, however, this essential difference, and perhaps it is apt to be overlooked, that, whereas the pre-War establishments were flying *schools* where pupils paid a premium of something like £100 to be taught to fly, the institutions now under consideration are *clubs*; and, although they will naturally wish to give their members as much flying as possible, it is not to be expected that each member should count upon getting a flight once a day, or even once a week. The essential difference between *school* and *club* should be realised, and the difference in fees taken into account. At the de Havilland Flying School at Stag Lane Aerodrome, Edgware, there is, we believe, a system in force by which a pupil pays by the hour an inclusive fee covering tuition, damages, and third-party risks. An apt pupil may learn to fly there at trifling cost. The light 'plane clubs are on an essentially different basis, in that they will have to depend upon the goodwill of the majority of members to enable the minority to learn to fly.

As we have said, we do not think it is any use expecting greater support from the Air Ministry, and the facts might as well be faced. Whether the actual amounts to be granted could be allocated to better advantage is, of course, another question. In order to bring the price of light 'planes, or of any type of aeroplane, for that matter, down, it is above all essential that large batches should be built. It has been suggested that the Air Ministry should place an order for a considerable number of machines, and should then sell them to clubs or to R.A.F. officers at cost price. If we assume that the Air Ministry could persuade the Treasury to sanction such a course, a very unlikely supposition, and that by placing with one firm an order for a batch of 50 machines, it is conceivable that the price could be reduced to something like £500 per machine. Without going into the desirability of such an arrangement, it would mean that the Air Ministry would get, if the whole of the £22,000 voted were spent on machines, about 50 light 'planes. Making each light 'plane club a present of four machines would leave the Air Ministry with approximately one-half of the machines to be disposed of to sources other than light 'plane clubs, or to the clubs to be paid for by such as could afford to buy extra machines. There is every chance that the Air Ministry might be left with some 15 machines at least, at the end of the first year, unless some scheme were devised for hiring out these machines to clubs at a reasonable figure, the Air Ministry to pay the insurance premium.

* * *

ON the whole we doubt if this scheme would be workable, and it might be better, for the first year or two, if the Air Ministry agreed to some arrangement for hiring out to the clubs at low rentals machines not necessarily light 'planes, but which could be obtained cheaply. There are in existence types of aeroplanes which are eminently suitable for school work, and the price of which is not prohibitive. Perhaps a scheme could be evolved whereby such machines could be made available for the light 'plane clubs to augment their flying stock for the first year or two, the clubs to pay the hire and the Air Ministry to look after the insurance. Thus the present suggested scheme could more or less stand, while the question of hiring out machines of other types to such clubs as were willing and able to pay the hire would be additional, and would only involve the Air Ministry in further commitments to the extent of the insurance of any machines thus hired. Thus at the start all the light 'plane clubs would be on an even footing, and those willing and able to afford the expense of hiring extra machines would forge ahead and would naturally as a consequence train the largest number of pilots.

* * *

BUT in all these speculations it has rather been taken for granted that the main object of the light 'plane clubs is to train pilots. This, as we have already pointed out, is not exactly the case, and the clubs should be more concerned with getting as many people as possible interested in flying, not necessarily as pilots but sufficiently keen to wish to go for passenger flights, etc., and so gradually spread the gospel of aviation to wide and ever-widening circles. Our love of the sea did not arise out of an artificially encouraged interest, but developed and grew gradually. So also must our love of the air in the main grow naturally, and all that can, and should, be expected is that this growth be hastened somewhat by some slight encouragement during the early period.

* * *

ALREADY seven entries have been received for the light 'plane and glider meeting to be held at Vauville, near Cherbourg, this summer. Curiously enough, the first three were from Belgium, machines Nos. 1, 2, and 3 being entered by the S.A.B.C.A. firm. No. 4 is entered by M. Georges Ligreau, Nos. 5 and 6 by Pander en Zonen, and No. 7 by Eric Nessler. The Belgian machines are said to have been designed by Poncelet and Jullien respectively, while the Pander, or at any rate one of them, is similar to that exhibited at the last Paris Aero Show, and described in FLIGHT of February 19, 1925. Incidentally, it may be mentioned that recently a Pander monoplane, with "Y"-type Anzani engine, flew from Paris to Brussels in 2¾ hours.

* * *

THE meeting will take place from July 26 to August 9, and entries at 50 francs for gliders and 100 francs for light 'planes are accepted up to May 26, and up to June 29 at double fee.

LIGHT 'PLANE CLUB DOINGS

WE shall be pleased to have reports regularly from Club Secretaries, or those directly connected with new Light 'Plane Clubs, so that by keeping our readers informed on this matter the whole movement may be helped forward to the benefit of the clubs and the popularising of "that Air feeling."

Light 'Plane Clubs are being, or have been, formed at:—

London.—Lieut.-Com. H. E. Perrin, Secretary, Royal Aero Club, 3, Clifford Street, W.1.

Birmingham.—Major Gilbert Dennison, Hon. Secretary, Midland Aero Club, Handsworth, Birmingham.

Glasgow.—J. Allison, Esq., Jnr., 219, St. Vincent Street.

Lancashire.—C. J. Wood, Esq., Secretary, Lancashire Aero Club, c/o A. V. Roe and Co., Newton Heath, Manchester.

Newcastle-on-Tyne.—Alex. H. Bell, Esq., Hon. Sec., Newcastle-on-Tyne Light 'Plane Club, County Hotel.

Yorkshire.—Prof. G. Brodetsky, Yorkshire Aeroplane Club, Leeds University.

We have received the following reports on the progress being made:—

Lancashire Aero Club.—The club has now obtained headquarters at the Nags Head Hotel, Lloyd Street, Deansgate, Manchester. Meals may be obtained in the dining-room, which is attached to the Club Lounge, at reasonable charges. Copies of FLIGHT will be taken each week. A Club Library has been commenced, and the Chairman of the Library Sub-Committee, Mr. D. F. Dyson, will be glad of any books relating to flying which are presented. The lounge is comfortably furnished, and sketches and photographs of aeroplanes are being obtained. It is hoped members will use this headquarters as much as possible. It will be open every day, and a number of members are expected to take lunch there. It will also be at the disposal of the members every evening except Tuesday, when the lounge will be reserved for Committee meetings. There will be a notice board in the lounge on which all engagements and activities will be posted, The notices will be changed at least once a week, and members are advised to keep in touch with what is going on by seeing this notice board.

The Club headquarters will be formally opened on Friday, March 13, at 7 p.m. There will be three short talks: Mr. T. Prince on "The Construction of Aircraft"; Mr. Rex Williams on "The Engines used in Aircraft," and Mr. A. Goodfellow on "Learning to Fly." Mr. Prince is with Messrs. A. V. Roe, Ltd., at Newton Heath, and is considered an expert on the practical side. Mr. Williams has had long experience with Aero engines, and is a technical expert of some repute; while Mr. Goodfellow has flown over a thousand hours, and was for more than four years in the R.F.C. and R.A.F. After these lecturers there will be refreshments, followed by a discussion.

AERONAUTICAL RESEARCH COMMITTEE REPORTS

FROM the number of enquiries we receive it appears that there is a desire in aircraft circles to know approximately the contents of the various technical publications of the Aeronautical Research Committee. All the aircraft firms probably receive these reports regularly, whether or not they contain anything of immediate interest or utility. In the case of draughtsmen, however, and others interested in aeronautics, who can hardly be expected to purchase all the reports, the problem of deciding whether any publication interests him is often a difficult one. As it is obviously desirable that the knowledge of aeronautics should be made available to all who take an interest in the subject, we have arranged with the Air Ministry to publish in FLIGHT summaries of all the technical publications as soon as these are issued, or shortly before they are published. All A.R.C. publications can be purchased from H.M. Stationery Offices at Adastral House, Kingsway, London, W.C.2; 28, Abingdon Street, London, S.W.1; York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 120, George Street, Edinburgh, and through any bookseller.

Reports and Memoranda, No. 939 (Ae. 160). On the Effect of Inertia on the Lateral Motion of an Aeroplane under the Influence of Gusts and Control Movements. By L. W. Bryant, B.Sc., A.R.C.Sc., and D. H. Williams, B.Sc. October, 1924. Price 6*d*. net.

In this report the effect on control of doubling the lateral moment of inertia of a machine and of increasing the directional moment of inertia by two-thirds is considered. Such a change was brought about by placing a load out on the planes of a Bristol Fighter which was tested in flight.* Calculations have been made similar to those described in Reports and Memoranda No. 805† for an angle of incidence of 10°, the motion during 5 secs. being determined for a constant applied rolling couple, a yawing couple, and various combinations of these corresponding with a movement of either ailerons or rudder or as resulting from gusts. It is concluded that the effect of even a large increase of rolling inertia is quite small, and that increased yawing inertia has no remarkably large influence on control, although an increase of two-thirds produces an easily noticeable sluggishness in response both to gusts and to control movements. The conclusions, of course, apply only to control in normal flight; there is reason to believe that the effect of inertia is much more pronounced when flying stalled or spinning.

The initial acceleration due to a yawing couple is very little diminished until more than one second has elapsed, whilst that due to a rolling couple is reduced to zero in something less than half a second. Hence, an increase of yawing inertia has a marked effect on the motion in yaw and roll during the first second or two of the application of a yawing couple, whilst an increase of rolling inertia has very little effect after the first half-second of the application of a rolling couple.

The applied couples arising from gusts and control movements are in general a combination of rolling and yawing couples, and it is shown that the effects of increases of inertia are, in the main, due to the smaller acceleration in yaw produced by a yawing couple of a given amount. Any serious increase in directional inertia should always be accompanied by an increase in effective rudder control.

*See R. and M. 849. The Effect upon the Control of an Aeroplane of Carrying Load distributed along the Planes. By the Aero-dynamics Staff of the Royal Aircraft Establishment.

† Some Calculations dealing with the Distributed Motion of an Aeroplane with special reference to landing."—By L. W. Bryant.

Air Ministry Helicopter Competition

THE Air Ministry announces: In view of the fact that none of the entrants for the Air Ministry competition for flying machines (helicopter) in 1924 has so far submitted a machine for test, arrangements are being made under the provisions of clause 24 of the conditions of the original competition for a second competition terminating on April 30, 1926. The prizes offered in connection with the second competition will be as stated in the conditions of the competition. All entries for the second competition must be received by April 30, 1925. Entrants for the original competition will be required to enter afresh for the second competition if they desire to compete therein. Entry forms and full particulars of the conditions can be obtained on application to the Secretary, Air Ministry, Adastral House, Kingsway, London, W.C.2.

It may be of interest to note that, so far, the only entrant that is prepared to submit a machine for test is the American, Berliner, who has been informed that Air Ministry experts are prepared to be present at the testing of his machine on any date convenient to him in April.

Saved by Parachutes

Two American pilots had a remarkable escape from death on March 6, when their machines collided at an altitude of 4,000 ft. over San Antonio (Texas). Both machines were locked together and fell in flames, but the pilots succeeded in jumping clear with their parachutes and landed without injury.

A Derelict Airship

A FRENCH Torres-Quevedo airship, bearing the number 3,122 N.N., was observed drifting with the wind, out of control, over the province of Santander, Spain, and, later, it came to earth at Outaneda. No one was on board the airship, and at the time of writing it is not known how the airship came to be at large.

"THE ROYAL AIR FORCE AS A CAREER"

THERE is a very common impression abroad that the Royal Air Force is an unsatisfactory career for an officer because there cannot be enough high appointments to give a young man a fair prospect of ever rising to air rank or even to Group Captain. This, perhaps, and also the belief which still persists that flying is excessively dangerous, probably affect the minds of parents whose sons would like to fly; though they would cheerfully face the prospect of a boy waiting for years for promotion in a line regiment or alternately breaking his neck in a cavalry steeplechase. Probably it was to combat the fears of a dangerous calling, coupled with a bad business proposition, that the Air Ministry have just published a neat little illustrated volume entitled "The Royal Air Force as a Career."

We rather wish, however, that the two points mentioned above had been seized, like the proverbial bull, by the horns. It is not rubbed in hard enough that the excessive proportion of junior officers to senior ones is dealt with to a great extent by the grant of short service commissions. No figures are given of rates of pay, allowances and pension—no doubt they can be found elsewhere, but they ought to be included in this volume; and no stress is laid on the growing safety of flying. Of course, service flying will never be as safe as civil flying ought to be; but the risks are not so great as to deter a young man (or his parents) who will face either steeplechasing or submarine work with equanimity. The prospects of airmen as contrasted with officers, are, however, put well and attractively. Nevertheless, the book seems to be written for prospective officers more than for prospective airmen.

The appeal made is to the sporting side of life in the force, to the joys of beagling at Cranwell, of travel, of sport in the East, with reference here and there to the delights of flying itself. There is a useful chapter on service overseas, which gives a list of the stations where R.A.F. units are quartered. We might point out in passing that Peshawar is not in the Punjab, but is the capital of the North-West Frontier Province. It is described as "about forty miles from Kohat," which is something like saying that London is in the neighbourhood of Hertford. The photographs which illustrate this chapter are well chosen, but might be better reproduced.

The book might, in fact, be better than it is, but it gives a clear and concise account of the Royal Air Force and its varied activities and branches. The chapter on Cranwell Cadet College is the best. The book should help to clarify muddled thought on the subject with which it deals, and we hope that it will serve a useful purpose. It certainly ought to be supplied broadcast to headmasters of public schools.

* His Majesty's Stationery Office. 3s. net.

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AMERICAN ORDERS FOR AIRCRAFT (ARMY AND NAVY)

SOME interesting figures, showing the number, type, etc., of aircraft ordered by the U.S. Government for the Army and Navy, are given in our American contemporary *Aviation*, and in view of the fact that our own Air Estimates have been just recently in the limelight, we think some of these figures may be of interest to readers of FLIGHT.

Perhaps the most important of these relate to the Government orders for aircraft scheduled for the fiscal years 1924–25 and 1925–26. Bearing in mind the fact that the following figures involve future commitments and certain other indefinite factors, they do, nevertheless, show generally that the various U.S. Government Departments plan to purchase less than 500 aircraft during the next fiscal year. The figures are:—

On Order, Fiscal Year ending June 30, 1925:—Naval Service.—82 machines (Curtiss, Packard, and Wright engines) from the Boeing Co., the order for 68 of which to be placed before July 1, 1925; 75 type CS 1 (575 h.p. Wright) from the Glenn Martin Co., and 72 machines (200 h.p. Wright water-cooled and air-cooled engines) from the Boeing Co.

Army Service.—50 type PT 1 (200 h.p. Wright) from Consolidated Co.; 10 (200 h.p. Wright) from the Huff Daland Co.; 3 from the Cox-Klemin Co.; 130 type DH 4M (400 h.p. "Liberty") from the Atlantic Co.; 10 (400 h.p. "Liberty") from the Douglas Co.; 12 (400 h.p. Curtiss D 12) from the Boeing Co.; 9 (400 h.p. inverted "Liberty") from the Loening Co.; and 15 "Dusters" (200 h.p. Wright) for the Department of Agriculture. A total, for both services, of 400.

Scheduled for Order, Fiscal Year ending June 30, 1926:—Naval Service.—27 fighters (400 h.p. Curtiss D 12); 43 observation (400 h.p. Wright air-cooled or Curtiss); 59 three-purpose torpedo; 23 scouting; 20 patrol; and 40 training.

Army Service.—158 primary training, advance training, ambulance, and observation; 50 bombing transport (800 h.p. Packard); 50 Persuit (400 h.p. Curtiss D 12); and 10 Attack (Wright or Packard). A total for both Services, of 480.

The following figures give the total number of machines, and types, ordered for the U.S. Army Air Service during the four years 1920–23:—(*a*) 1,610 remodelled DH machines. (*b*) 681 new machines ordered from the Industry of the following types—XB 1A (42); SE 5A (50); MB 3 (62); MB 3A (200); Orenco D (50); PW 5 (10); PW 8 (25); MB 2 (20); MBS 1 (85); GAX (10); OW 1 (1); MBL 1 Barling (1); VE 7 (7); VE 9 (27); TA 3 (10); TW 3 (20); messengers (26); Loening seaplanes (8); transport (10); single-seater Persuit (3); Verville-Sperry racers (3); Curtiss Eagles (3); Thomas Morse racers (3); Loening racers (3); Curtiss racers (2).

(*c*) Ten machines from McCook Field as follows—PW 1 (1); TP 1 (1); GAX (1); CO 1 (1); CO 2 (1); TW 1 (1); XB1A (2); CO 5 (1); VCP 1—Verville-Packard racer—(1). A total for all classes of 2,301.

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AERODROME WIRELESS ORGANISATION

WIRELESS communication is an important factor in the organisation of the airways, and it is being increasingly used in the air services which are being developed all over the Continent of Europe. In connection with the programme of development in Roumania, the Roumanian War Ministry has ordered from Marconi's Wireless Telegraph Co., Ltd., two aerodrome wireless stations and twelve complete aircraft sets. The aerodromes and machines will be so equipped that communication between them can be maintained at all times, and the ground stations will be able to communicate with one another to exchange weather reports and other information of value in connection with the service.

The ground station equipment will consist of ½-kilowatt valve transmitters for telephony and telegraphy. They will be of the cabinet type, operated from the receiving station by remote control. The receiving stations will include the well-known Marconi type 12A direction finder, as used at Croydon, Berne, and many other aerodromes and coastal wireless stations. This receiver, when not engaged in receiving any particular station, can be adjusted to receive calls from all directions, but by a single switch movement the operator can concentrate on one direction only, and obtain bearings of a transmitting station or use the directional effect to eliminate interference with ordinary reception. Line amplifiers are also installed at the receiving station to magnify land line speech before it reaches the transmitter. This device enables conversation to be carried on direct with the ordinary telephone system to an aeroplane *via* the wireless transmitter. A small switchboard in the receiving room enables the operator to control the distant transmitter, and also to complete the connection between the land telephone system and the wireless system.

The twelve aircraft sets are of the Marconi AD6 type for telephony and telegraphy, the transmitter using 150 watts. The complete equipment is contained in one instrument case, which can be installed in the machine in an out-of-the-way corner, and is controlled from the pilot's seat by a remote control switch. This allows the pilot to make fine adjustment in tuning, and also to change over from send to receive. A great advantage of this system is the absence of apparatus in the close vicinity of the pilot, so that he is free to attend to his flying duties while maintaining full control of his wireless installation.

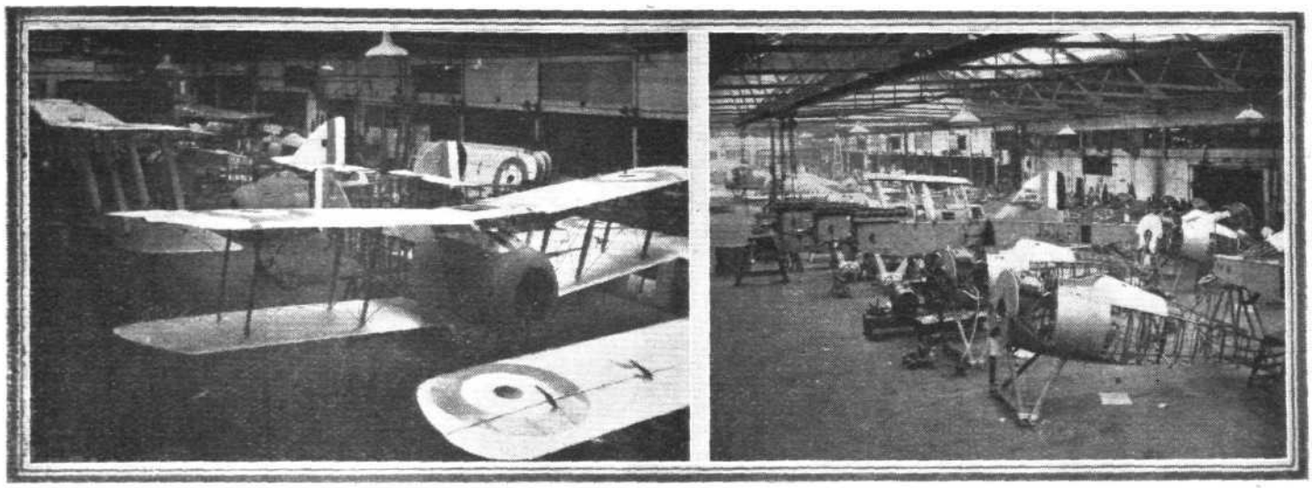
The range of the AD6 set naturally varies in accordance with local conditions, and therefore in common with all wireless apparatus it is impossible to give a definite range of transmission and reception; but telephonic communication can be usually relied on over distances of from 100 to 150 miles, while telegraphic communication can be maintained over approximately twice that distance.

FLIGHT
AIRCRAFT ENGINEER AND AIRSHIPS

THE HAWKER ENGINEERING COMPANY

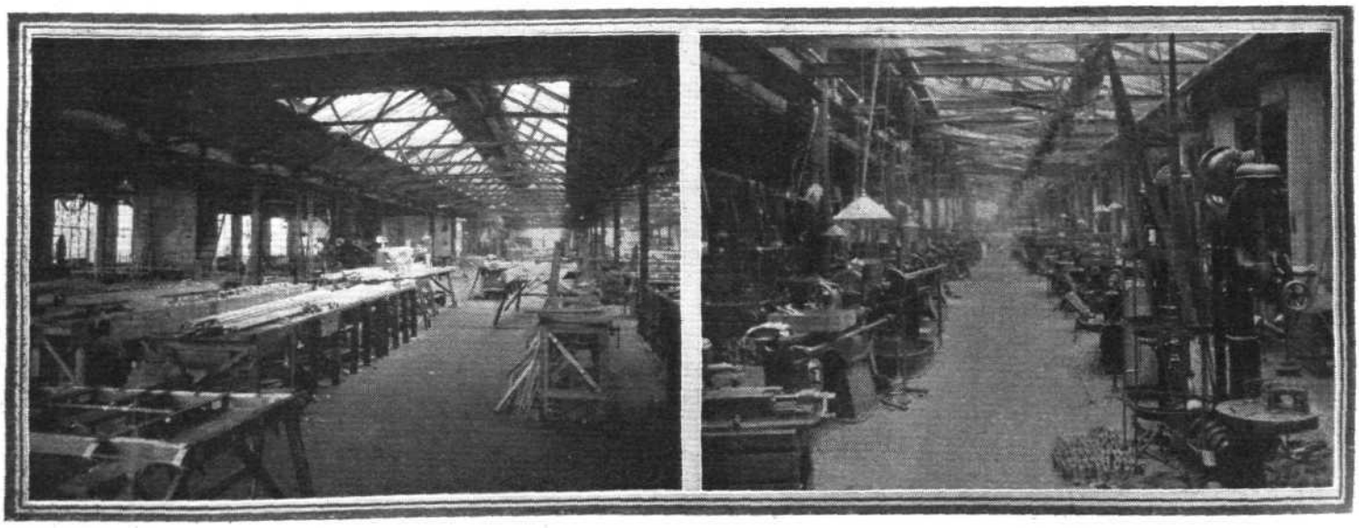
Kingston Factory Busy

THERE can be little doubt that we have now turned the corner, and that those aircraft firms who have struggled through the period 1919–1923 are fairly certain of some substantial reward for their faith in the future of aviation, and for the courage and determination which carried them through what has for most firms been an exceedingly difficult period. Although there are at the present time very few firms in this country that are absolutely full up and working to their maximum capacity, there are, on the other hand, few that have not got on hand at least enough work to enable them to carry on comfortably, and the Air Estimates for the financial year 1925–26 appear to give promise of increased activity all around. In the case of the H. G. Hawker Engineering Co., Ltd., to whose works at Kingston-on-Thames we paid a visit recently, it is all the more gratifying to find plenty of work, since the firm was founded by, and still includes, many who were among the pioneers of British aviation, although the firm itself is of relatively recent date. Mr. T. O. M. Sopwith was, of course, one of the early Brooklands workers, and associated with him from the beginning has been Mr. F. Sigrist, who is now joint managing director with Mr. Sopwith. The names of several others, associated with Mr. Sopwith, in the old Sopwith firm which attained world fame during the War, might be mentioned, and so there is good reason for regarding the firm, in spite of its financial dissociation from the Sopwith Company, as one of the "old-timers." Readers of FLIGHT will recollect that when the Hawker company was formed by Hawker, Sopwith, and Sigrist, the firm commenced by designing and building motor-cycles, taking over the Sopwith works at Kingston. It was not long, however, before aircraft work was resumed, and for some considerable time now the whole of the one-time Sopwith factory has been devoted to aircraft production. This does not, of course, mean that for the whole of this period the entire factory has been filled with aircraft machinery, but it does mean that should the emergency arise the Hawker Engineering Co. could, at very short notice, turn to mass production, and, as already mentioned, there is at present sufficient work in hand to keep a fairly big staff of workmen employed.

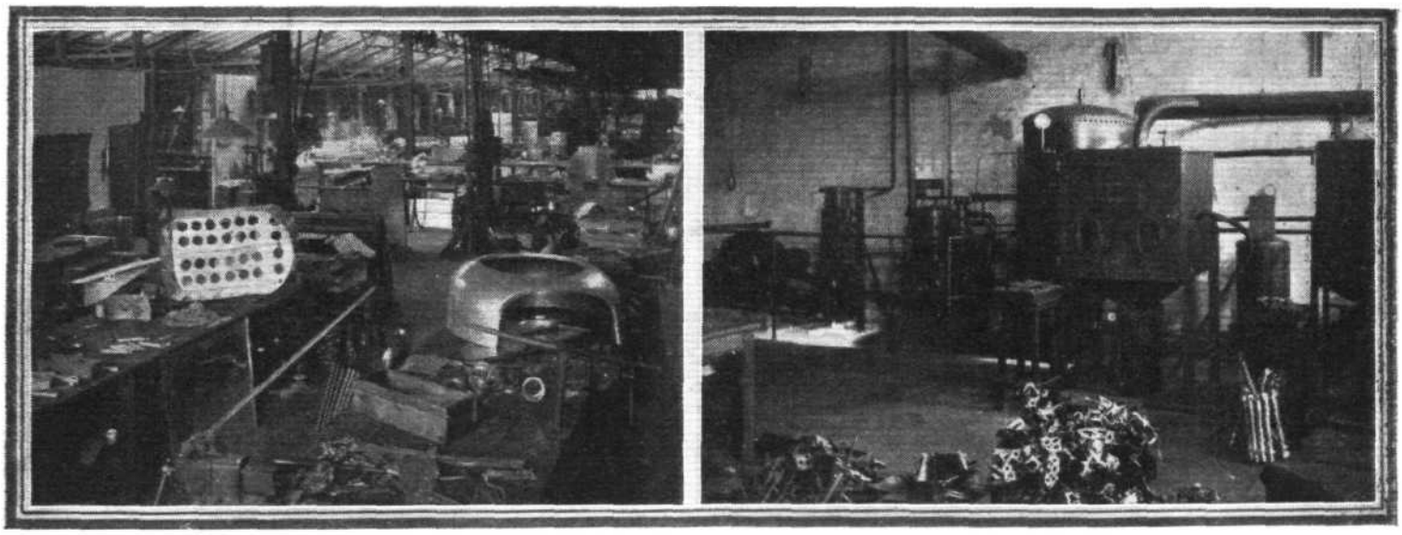


HAWKER ENGINEERING COMPANY: Two views in the erecting shops. The machines in course of construction are Snipe and D.H.9A's.

A visit to the Hawker factory the other day revealed the fact that all the most recent methods of manufacture are in use there, at any rate as regards the production of the usual composite types of aircraft. For all-metal construction the works are not yet fully equipped, but from this fact it should not be inferred that the firm is not doing any metal work. On the contrary, a considerable amount of experimental work is being carried out, and at least one type of all-metal



HAWKER ENGINEERING COMPANY: On the left one end of the 'plane assembly shop, and on the right the large machine shop.



HAWKER ENGINEERING COMPANY : Left, a corner of the tinsmiths' department ; and right, a portion of the sandblasting department.

machine is in an advanced stage of construction. In order to render possible the production of machines of metal without laying down a large and very expensive plant, some highly interesting forms of metal construction have been evolved, and we were privileged to see examples of metal wing spars of a form which has not, to the best of our knowledge, hitherto been produced by any other firm. Unfortunately we are not at liberty to describe these spars, but we understand that they have been tested and officially passed, so that it may be taken for granted that the type is sound. It should certainly be relatively cheap to manufacture, and as a production job should be capable of being turned out rapidly.

Along the usual lines of construction the Hawker Engineering Co. has developed manufacture to a high pitch of perfection. On the timber side a considerable amount of research work and testing is being done, apparatus having been installed for taking measurements of samples for moisture contents, etc., and quite recently the firm has had specially made to the designs of Mr. Bennett, one of the directors of the firm, a very large testing machine in which compression and tensile tests can be carried out on specimens as long as 9 ft. Thus even very long struts can be tested full size, and the merits of particular forms of construction ascertained.

In the metal work departments, apart from the experimental shops, an extensive plant is in operation for the manufacture and after-treatment of metal components and fittings. Sandblasting is extensively employed, and all metal fittings are being electro-tinned before enamelling so as to ensure as far as possible the permanence of the enamel and protection from rust. In addition to work on their own machines the firm has undertaken the construction of undercarriages for another firm, and altogether the large factory, an idea of the size of which may be formed from the accompanying photographs taken recently, is kept pretty fully occupied.

Concerning the machines in course of construction at Kingston, it is not permissible to say very much, as several of them are of the " hush-hush " type, but in addition to Snipe and D.H. 9A'a, of which the firm has re-conditioned a very large number, a batch of " Woodcocks " with Bristol " Jupiter " engines is progressing rapidly, and it seems likely that during the present year at least one R.A.F. squadron will be equipped with this type. Photographs of the " Woodcock " were published in FLIGHT some months ago, and it will be recollected that the machine is a high-performance single-seater fighter. Other machines, of still more recent type, but about which nothing whatever may be said, are finished, and ready for their flying tests.

Lest it should be thought that the Hawker Engineering Co. confines its activities to military machines, we might mention that we had the pleasure of inspecting the drawings of a racer which should go a long way towards reinstating Great Britain in a leading position in the sphere of sporting aviation. The Sopwith firm, from the very earliest days, was always a firm believer in the value of taking part in sporting events, and Mr. Sopwith himself was, in the old days, seldom missed from any list of flying competitions, of which he won a good many, beginning with the de Forest Prize for a flight from England to Belgium in 1911. The Hawker firm built a racer with Bristol " Jupiter " engine for the Aerial Derby some years ago, but the machine was, unfortunately, crashed, and since then no high-speed sporting machine has been produced. Happily there is now good reason to hope that a really modern racer may carry the Hawker-Sopwith racing colours, and that a valuable addition to British air-racing will materialise at an early date. The racer, like all recent Hawker aircraft, has been designed by Mr. Carter, the firm's chief designer, who is now ably seconded by Mr. S. Camm, who was, it may be recollected, mainly responsible for the splendid little light 'planes flown by Longton and Raynham at Lympne last year. In connection with the " Cygnets " it is of interest to note that one of these has been flying frequently ever since at Martlesham, and that no adjustments or replacements of any kind have been found necessary. With the A.B.C. " Scorpion " engine this machine has an excellent performance, and but for the unfortunate engine failure at the last minute Raynham would undoubtedly have secured first prize at Lympne last year. The top speed of the " Cygnet " is, we believe, a little better than 80 m.p.h. Although the light 'plane question is at present in a very undecided state, it may be hoped that in this direction also the Hawker company will be taking an active part if and when we really get down to brass tacks.

Altogether it can be said that the Hawker Engineering Co. is very much alive at the present moment, and under the energetic leadership of Mr. Sopwith and Mr. Sigrist, backed by an experienced staff, the firm should make great strides in the near future and thus worthily carry on the traditions of the old Sopwith Co. with which a good number of the present personnel were connected.

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Brussels-Congo Flight

LIEUT. THIEFFRY, who is flying from Brussels to Belgian Congo on a three-engined Handley Page biplane, left Niamey (where he arrived on February 25) on March 1 at 6.50 a.m. He was forced to descend at Tessowa at 1.15 p.m., owing to the intense heat. The flight was resumed at 8 a.m. next morning, and an hour later Zinder was reached.

Government Aeronautical Exhibit at Wembley

THE Secretary of the Royal Aeronautical Society informs us that it is proposed to form a historical exhibit for this year's Wembley Exhibition dealing with the history of flying from the earliest times to the present day. Any member of the R.Ae.S. or any reader of FLIGHT having any books, prints, *objets d'art*, models, curios, etc., which he would be prepared to lend for this purpose, is invited to communicate with the Society's Honorary Librarian, J. E. Hodgson, Esq., 115, Chancery Lane, London, W.C.2. All objects loaned will be fully insured and the source acknowledged.

Canadian Forest Patrol

AIR patrol of the Northern Ontario forests has proved so successful in the past that the Government has decided to increase the number of machines carrying out this work in the future, all of which will be equipped with wireless.

FLIGHT
AIRCRAFT ENGINEER AIRSHIPS

THE ROYAL AIR FORCE

London Gazette, March 3, 1925

General Duties Branch

The follg. Pilot Officers are promoted to rank of Flying Officer (Feb 15) :—G. R. M. Clifford, R. A. P. Roberts, T. B. Prickman, H. M. Mellor. Wing Commander P. S. Rickcord (Commander, R.N., retd.) remains on loan to R.A.F. for a further year (March 1). The follg. Pilot Officers on probation are confirmed in rank (Jan. 8) :—H. B. Barrett, S. F. Bell, W. A. Cooke, J. E. Davies, L. A. Egglesfield, A. C. Evans-Evans, H. R. Gillespie, W. E. Gray, M. H. Jenks, D. J. Lloyd, H. Miller, C. H. Morgan, R. W. Steele, A. J. Thompson, C. W. L. Trusk, H. Walker, D. G. Wilson. Flight Lt. D. F. FitzGibbon, D.S.C., is transferred to the Reserve, Class C. (Feb. 28).

Stores Branch

The follg. are granted permanent commissions in ranks stated (March 4) :—Flight Lt. F. H. Sims ; Flying Officer C. Littlejohn, M.M. Flying Officer R. D. Lambert is placed on half-pay, scale A (Feb. 16).

Accountant Branch

Flying Officer J. R. Bond is transferred to Reserve, Class C (March 5) ; Flying Officer C. L. P. Mullany is removed from R.A.F. (Feb. 20).

Medical Branch

The follg. are granted short service commissions as Flying Officers, for three years on the active list, with effect from, and with seniority of, Feb. 18 :—L. C. Palmer-Jones, M.B., T. W. Wilson.

Reserve of Air Force Officers

H. A. Seaby is granted a commn. in Class A, General Dutires Banch, as Flying Officer on probation (March 3). The follg. Pilot Officers are promoted to rank of Flying Officer :—J. M. S. Taylor (Feb. 26) ; J. Fairbairn (Feb. 28). The follg. are confirmed in rank (March 2) :—FLYING OFFICERS.—M. D. Allen, R. Y. Bush, E. S. Clark, L. P. Openshaw, E. H. Stuart. PILOT OFFICERS.—J. S. Napper, D.C.M., H. C. Norman.

The follg. Flying Officers are transferred from Class A to Class C :—W. A. Rochelle (March 3) ; E. D. Salthouse (March 3) ; I. Welby, M.C., D.F.C. (Feb. 18). Flying Officer H. A. Smith is transferred from Class B, General Duties Branch, to Class B, Stores Branch (Feb. 18) ; Pilot Officer J. K. Reid relinquishes his commission on account of ill-health (March 4).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Group Captain: C. L. Courtney, C.B.E., D.S.O, to R.A.F. Depot, pending disposal on transfer to Home Estabt ; 4.1.25. D. O. Mulholland, A.F.C., to R.A.F. Depot, on transfer to Home Estabt. ; 17.1.25. F. W. Bowhill, C.M.G., D.S.O., to Aircraft Depot, Egypt, to command, 19.2.25.

Wing Commander E. Osmond, C.B.E., to H.M.S. "Eagle," pending taking over command of R.A.F. Unit, 19.2.25.

Squadron Leaders: T. H. England, D.S.C., A.F.C., to Aeroplane and Armament Experimental Estabt., No. 22 Sqdn., Martlesham Heath ; 2.3.25. R. M. Field, to Air Ministry ; 2.3.25. H. Dawes, M.B.E., to No. 6 Group H.Q., Kenley ; 25.2.25. T. F. Bullen, O.B.E., to No. 1 Flying Training Sch., Netheravon, 16.3.25. G. W. Williamson, O.B.E., M.C., to Inland Area Aircraft Depot, Henlow, 23.3.25.

Squadron Leaders: E. J. Hodsoll to H.Q., India, 27.2.25. T. F. Hazell, D.S.O., M.C., D.F.C., to No. 60, Sqdn., India, 27.2.25. B. P. H. de Roeper, A.F.C., to R.A.F. Depot, 11.3.25. J. O. Andrews, D.S.O., M.C., to Aeronautical Committee of Guarantee, Germany, 11.3.25. N. F. D. Buckeridge to Air Ministry, 1.4.25.

Flight Lieuts.: D. F. Lucking, to No. 1 Flying Training Sch., Netheravon ; 7.2.25. R. M. Taylor, M.C., to R.A.F. Depot, on transfer to Home Estabt. ; 17.1.25. B. D. S. Tuke, to H.Q., Inland Area ; 2.3.25. D. Craik, D.F.C., to No. 3 Group H.Q., Spittlegate ; 2.3.25.

Flight Lieutenants: J. W. Hosking, M.B.E., to Inland Area Aircraft Depot, Henlow, on transfer to Home Estab., 2.3.25. H. G. Crowe, M.C., to H.Q., Iraq, 27.2.25. S. P. Simpson to No. 30 Sqdn., Iraq, 4.2.25. S. B. Harris, D.F.C., A.F.C., to H.Q., India, 19.2.25. P. H. Davy to No. 31 Sqdn., India, 16.2.25. S. E. Storrar, to No. 4 Flying Training Sch., Egypt, 22.2.25. W. N. Cumming to No. 27 Sqdn., India, 4.2.25. R. S. Sugden, A.F.C., to No. 1 Sch. of Tech. Training (Boys), Halton, 2.3.25. W. H. Dunn, D.S.C., to Sch. of Army Co-operation (No. 16 Sqdn.), Old Sarum, 28.3.25. A. D. Pryor to Air Ministry, 14.3.25. J. W. Jones to Aeroplane and Armament Experimental Estabt. (No. 15 Sqdn.), Martlesham Heath, 1.4.25. J. F. T. Barrett, D.F.C., to Experimental Section, R.A.E., S. Farnborough, 10.4.25.

Flying Officers: H. J. Storey, to R.A.F. Depot (Non-Effective Pool), on transfer to Home Estabt. ; 27.1.25. A. E. Gliddon, to Schl. of Tech. Training (Men), Manston ; 1.3.25. A. T. K. Shipwright, D.F.C., to No. 2 Sqdn., Manston ; 6.3.25. A. P. C. Hannay, M.C., to Sch. of Army Co-operation (No. 16 Sqdn.), Old Sarum ; 8.3.25.

Flying Officers: D. F. Anderson, D.F.C., to Aeroplane and Armament Experimental Estabt. (No. 15 Sqdn.), Martlesham Heath, 16.3.25. D. R. Mitchell, M.B.E., to Armament and Gunnery Sch., Eastchurch, 16.3.25. L. de V. Chisman to No. 28 Sqdn., India, 27.2.25. L. A. W. Deane to No. 1 Sch. of Techn. Training (Boys), Halton, 10.3.25. C. C. Bazell to R.A.F. Depot (Non-effective Pool) on transfer to Home Estabt., 17.1.25. S. McKeever to R.A.F. Depot (Non-effective Pool) on transfer to Home Estabt., 4.2.25. A. I. Riley, A.F.C., to No. 55 Sqdn., Iraq, 27.2.25. W. A. Opie to No. 31 Sqdn., India, 27.2.25. J. Durward to Air Ministry, 10.3.25. R. S. Martin to H.Q., Inland Area, 19.11.24. F. Jezzard, M.B.E., to Inland Area Aircraft Depot, Henlow, 11.3.25. W. G. Jones to No. 58 Sqdn., Worthy Down, 18.3.25. M. H. Aten, D.F.C., to remain at No. 12 Sqdn., Andover, instead of to Cadet College, Cranwell, as previously notified. H. W. Taylor to R.A.F. Cadet College, Cranwell, 11.3.25. C. G. Halliday to Experimental Section, R.A.E., S. Farnborough, 16.3.25. V. Croome to Inland Area Aircraft Depot, Henlow, 17.3.25. C. H. V. Hayman to Boys' Wing, Cranwell, 27.3.25. R. W. Hill to No. 39 Sqdn., Spittlegate, 16.3.25. W. N. Sherlock, to No. 11 Sqdn., Netheravon, 30.3.25.

Pilot Officers: J. A. P. A. Yearsley to No. 28 Sqdn., India, 27.2.25. B. F. H. Harding to Inland Water Transport, Iraq, 27.2.25. R. E. Coupland to No. 20 Sqdn., India, 27.2.25. V. W. Soltau to Aircraft Depot, India, 27.2.25. C. R. Troup, to No. 39 Sqdn., Spittlegate ; 15.2.25.

Stores Branch

Squadron Leader: E. W. Havers, to R.A.F. Depot, on transfer to Home Estabt. ; 17.1.25.

Flight Lieutenants: L. H. Vernon to Engine Repair Depot, Egypt, 13.2.25. K. A. Smith, to Elec. and Wireless Sch., Flowerdown, 5.3.25.

Flying Officers: E. R. Wood and H. Parker, to Aircraft Depot, India, 27.2.25.

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IN PARLIAMENT

Airship Development

LIEUT.-COMMANDER KENWORTHY on March 3 asked the Prime Minister whether it is proposed to place the new airship service in any way under the control of the Admiralty ?

The Prime Minister : No change has been made in the Air Ministry's responsibility for airship development.

Lieut.-Commander Kenworthy : Is it proposed to make a change ?

The Prime Minister : Not that I am aware of.

Anglo-Scandinavian Air Services

SIR G. BUTLER asked the Postmaster-General whether an air mail service has been established between Rotterdam and Malmo in accordance with the recommendations of The Hague Air Mail Conference of November, 1923 ; and whether there are as yet indications that the service is working satisfactorily from the point of view of Anglo-Scandinavian air mail communication ?

Sir W. Mitchell-Thomsom : The air mail service between Rotterdam and Malmo, which was recommended at the Conference referred to, was instituted in July last. British mails for Norway and Sweden, however, were already being conveyed by the slightly shorter but equally useful Rotterdam-Copenhagen service, which had been started in the previous May. I regret to say that this service did not attract much traffic. Both services are suspended for the winter season.

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CORRESPONDENCE

UNIVERSITIES AND FLYING

[2088] *A propos* of your excellent editorial comments in this week's FLIGHT, it may interest you to know a little more of how things stand at this university. To start off with, there is a definite clause in the University Statutes which runs :—"No undergraduate shall take any part whatsoever in aviation." I admit this is more of an inconvenience than an insurmountable barrier, but still, while that rule holds, no proper organised interest can be taken in the new scheme actually *in* the university, which is annoying, to say the least of it.

On the other hand, the question crops up, "Is there any enthusiasm to be found in the university ?" Personally, I know there is *some*, but not half as much either as one would expect or desire.

I am sure, however, that if a lot of people here saw a light 'plane they would go dotty about it, but, as I said, as long as this ban on aviation holds, nothing really progressive can be done, and the University authorities will have to be tackled with extra special care and tact.

Oxford, March 6, 1925. G. V.

PUBLIC SCHOOLS AND FLYING

[2089] It was with great interest that I read in the Editorial Comments in the last issue of FLIGHT of the suggestion made by Brigadier-General Warner of flying being taken up as a sport by our public schools and universities.

I had often thought that such would be an excellent idea myself, but, of course, nothing can be done unless the Air Ministry takes the matter in hand. As a matter of fact, I had thought of trying to form an aeronautical association at Harrow, which, although it would be of no value in building up a reserve of pilots, would encourage "that air feeling." Enquiries, however, reveal that, at most, a dozen members of the school are directly interested in aviation, and so a membership of twenty or thirty would be the greatest possible number which could be obtained. Under such conditions the formation of an association is not worth while.

But if the Air Ministry were to take the matter in hand, and grant each public school or university interested an allowance of, say, £2,000, as it has the Light 'Plane Clubs, the public schools, or some of them, at any rate, would turn out a number of good pilots for the reserve yearly.

Let us hope that the Air Ministry will act soon.

Harrow-on-the-Hill. H. H. LEECH.

ROYAL AERONAUTICAL SOCIETY

(Official Notices)

NOTICE is hereby given that the annual general meeting of the Royal Aeronautical Society will be held on Tuesday, March 31, 1925, at 5.0 p.m., at the offices of the Society, 7, Albemarle Street, London, W.1.

Agenda.—(i) To approve the report of the Council on the state of the Society, and the balance sheet of Aerial Science, Ltd., as printed in the *Journal of the Royal Aeronautical Society* for March, 1925; (ii) to discuss and determine such questions as may be proposed by the voters relating to the affairs of the Society, and to fill the vacancies on the Council for the ensuing year. Any voter desirous of proposing any subject for discussion at the annual general meeting shall give notice in writing to the Secretary, which shall be received by him by noon on March 17, 1925.

The retiring members of Council are: L. Bairstow, T. R. Cave-Browne-Cave, Sir M. D. Chalmers, C. R. Fairey, J. T. C. Moore-Brabazon, M. O'Gorman, J. L. Pritchard, The Master of Sempill, R. V. Southwell, H. T. Tizard, who are eligible for re-election.

Silver Medal.—The silver medal for the best paper published in the *Journal* during the year 1924 has been awarded to the paper entitled "Sound Reception," by Maj. W. S. Tucker, D.Sc., which appeared in the issue for August last year.

Lectures.—The next fortnightly meeting of the Royal Aeronautical Society will take place in the Library at 7, Albemarle Street, at 5.30 p.m., on Thursday, the 19th inst., when Capt. F. Tymms, M.C., will read a paper on "The Practical Navigation of Aircraft."

On the following Thursday, the 26th inst., Dr. Eckener will read a paper on "Modern Zeppelin Airships," at 7.0 p.m., at the Royal Society of Arts, 18, John Street, Adelphi, W.C. 2.

W. LOCKWOOD MARSH, Secretary

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The Gloucestershire Aircraft and Engineering Society

THE second meeting of this Society was held at Sunningend Works on March 4, in the Canteen Staff-room, and was very largely attended. The lecturer was Col. the Master of Sempill, A.F.C., A.F.R.Ae.S., and he took as his subject "Aviation in Japan," which dealt with the successful work of the British Aviation Mission to Japan in 1921 under his command. The lecture was illustrated by means of a great number of interesting slides. As a large part of the flying equipment was provided by the Gloucestershire Aircraft Co., it was of great interest to all members present to hear of the work of those machines which took such an important part in upholding British prestige in the Far East. Mr. Longden, of the Gloucestershire Aircraft Co., presided, and at the end of the meeting moved a vote of thanks to the lecturer for his most interesting address. Capt. Charley, the foreign representative of the Gloucestershire Aircraft Company, seconded this vote of thanks.

British Aircraft Carriers Refit

THE aircraft carrier *Hermes* (Capt. the Hon. Arthur Stopford, C.M.G.), at present at Malta, is to return to England shortly to refit. On completing this, the vessel will be recommissioned at Chatham, and her crew, after being given foreign service leave from depôt, will proceed to Portsmouth to recommission the aircraft carrier *Furious*. The latter has been in dockyard hands at Devonport since June, 1922, undergoing alterations which are expected to be completed on May 19.

The Avro-Airdisco at Martlesham

FOR some time past the Aircraft Disposal Co., Ltd., has been carrying out numerous demonstration and test flights with the "Avro-Airdisco" biplane at Croydon, and on March 7 Mr. Perry, the company's test pilot, took it over to Martlesham Heath for further tests. This machine, which was illustrated in FLIGHT for February 25 last, is a "Die Hard" Avro 504 type modified to take the 120 h.p. 8-cyl. V air-cooled Airdisco engine, which is giving such excellent results.

K.L.G. Plugs and Big Flight to India

THE Robinhood Engineering Works, Ltd., of Putney Vale, S.W. 15, have received from Mr. Alan Cobham the following cablegram, which calls for no comment:—

"Nearing finish 17,000-mile flight, survey through Iraq, India, to Rangoon and back. Throughout flight done with the same De Havilland type fifty aeroplane and Siddeley engine. We have used same two sets 'K.L.G.' plugs, and during rain or heat plug trouble has been unknown to us. Certainly I can ask for no better plug.—Alan Cobham."

A Very Beautiful Production

WE have received from D. Napier and Son a very beautiful album containing reproductions, in photogravure, of photographs of a large number of modern aircraft, British and foreign, fitted with Napier aero engines. The album has evidently been produced regardless of cost, and is, apart from the value of the illustrations as representing modern aircraft practice, one of the most beautiful productions ever published dealing with aviation matters. The album contains, as regards its reading matter, a brief description of Napier aero engines and a record of their achievements, arranged in three columns to the page and printed in French, English and Spanish. There should thus be practically no civilised country in the world in which one or other of the descriptions cannot be read. Covering each photogravure reproduction of an aircraft is a transparent sheet upon which is printed a brief statement explaining the purpose for which the machine was designed. When we mention that the types illustrated include single and twin-engined land machines, float seaplanes, and flying boats, as well as racing types and commercial aeroplanes, it will be seen that practically all modern types are represented, and for this reason alone the album should be worth possessing. In view of the excellent paper, the photogravure reproductions, and the general quality of the album the price of one guinea asked for it does not seem dear. Those desiring a copy should write direct to D. Napier and Son, Ltd., Acton Vale, London, W.3.

R.A.F. Plane Falls on a School

ON March 4, Flying Officer A. H. Montgomery, of No. 32 Squadron, Kenley, while flying a Gloucestershire Grebe at Warsash, near Southampton, crashed into a hut used as a cookery school. A woman teacher and two girl pupils were injured, and another girl, Dora Ball, died from injuries received shortly after the accident. The pilot escaped with minor injuries.

* * * *

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1923

Published March 12, 1925

22,923. VICKERS, LTD., O. D. LUCAS, and F. G. L. JOHNSON. Fuzes for bombs adapted to be dropped from aircraft. (228,962.)

29,272. A. ROHRBACH. Directional control of seaplanes on the water. (207,207.)

29,367. D. J. MOONEY. Metal framework for aircraft. (229,017.)

APPLIED FOR IN 1924

Published March 12, 1925

2,813. J. F. STUART. Instrument for ascertaining course on which an airship is steering. (229,077.)

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